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TECHNICAL REPORT
75-36-OR/SA

**AN EVALUATION OF
FOOD SERVICE SYSTEMS AT FT. MYER,
BOLLING AFB AND FT. BENJAMIN HARRISON**

by

Ronald L. Bustead

Robert J. Byrne

Mark M. Davis

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September 1974

UNITED STATES ARMY
NATICK LABORATORIES
Natick, Massachusetts 01760



OPERATIONS RESEARCH AND SYSTEMS ANALYSIS OFFICE

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I. INTRODUCTION

In response to a request from Troop Support Agency, Fort Lee, Virginia, US Army Natick Laboratories (NLABS) conducted a comparative evaluation of the food service operations at Fort Myer, Virginia; Bolling Air Force Base, Maryland; and Fort Benjamin Harrison, Indiana. These three bases each represent different types of food service systems, which are respectively: contract provided food and labor, contract labor with government supplied food, and government (military) employee labor (except for a KP contract) with government supplied food.

The Operations Research and Systems Analysis Office had the responsibility for comparing the costs, nutritional aspects and consumer attitudes involved in these three different systems of food service. The following kinds of data were collected at each location for this purpose:

1. Annual expenditures for food service operations and the number of meals served.
2. The actual food items comprising a meal selected by each of a large sample of individual consumers (tray selection data).
3. Food items not eaten by individual consumers (tray waste data).
4. A survey of customer opinions of the food, service, and facility (consumer interview data).

These data provided the basis for the comparisons of the three different systems of food service as reported herein.

II. COST ANALYSIS

Estimated total annual costs, i.e., actual expenditures, for Ft. Myer, Bolling AFB and Ft. B. Harrison are summarized in Table 1. These costs, except for building and equipment maintenance and utility costs, are presented on a per meal basis in Table 2 to adjust for the different feeding levels at the three locations. The exclusion of the maintenance and utility costs from the calculated per meal costs was based upon the opinion that these are fixed costs dependent upon the physical condition of the facilities and equipment at the particular installation over which the food service operators, contractor or military, have very little control. The detailed cost data supporting these tables are contained in Appendix A. As shown by these data the cost per meal in the Ft. Myer system of food service, at the time this comparison was accomplished, was significantly less than the cost per meal of the other two systems.

Labor Cost

The cost of labor, except for the twelve government personnel assigned to administer and monitor the contract, was not available at Ft. Myer and could not be determined. Therefore, the total cost of the contract (which included food, labor, etc.) together with the cost of the monitoring personnel was used together with the number of meals served to determine the annual costs, and the average cost per meal served. The contract cost of labor at Bolling AFB was readily available. This contract cost at Bolling AFB was used as the annual cost of labor and to compute the cost of labor for each meal served. The annual cost of labor at Ft. B. Harrison included the cost of military labor and the cost of the KP labor contract. This annual labor cost was used to compute the labor cost for each meal served. Comparisons of the annual costs indicate significant variations in the labor employed by the different systems, which illustrate areas of potential cost savings. The number of people involved in contract administration at Ft. Myer seems high now that operational status has been achieved. Reduction of these personnel to a more reasonable level would reduce the Ft. Myer per meal costs. Table 3 shows the manpower identified with the food service operation at the three installations.

Ft. B. Harrison KP contract costs seem high, especially when compared to the contract labor costs (KP and cooks) at Bolling AFB. At Bolling AFB, the labor cost per meal for both KP's and cooks was 58 cents per meal, while the KP contract cost per meal at Ft. B. Harrison is only 8 cents less, or 50 cents per meal. If these costs were reduced to comparable levels with Bolling AFB, then total per meal costs at Ft. B. Harrison would nearly approximate those at Bolling AFB since food costs per meal are nearly identical.

Food and Related Meal Costs

The total food costs and food costs per meal could not be obtained for all three systems. As with the labor costs it was not possible to break out the total food cost or food cost per meal at Ft. Myer. Therefore, this food cost factor was not included in Tables 1 and 2. However, since the total contract cost at Ft. Myer included all costs, it was possible to compute total and average meal cost. The total food costs were available at Bolling AFB and Ft. B. Harrison. These total costs are the actual costs to the commissary of the food issued to the dining hall at each of these posts. These figures were used to obtain total food costs for each installation and an average meal food cost for each installation.

Because it was not possible to compare raw food costs among Ft. Myer and the other two installations it was deemed desirable to compare food costs in another manner. Since a large sample of data was collected on what food components were selected by customers on their trays it was possible to use these data together with portion size data

to compare the approximate food cost of the actual meals served to customers at each of the three installations. The purpose of this evaluation was to compare portion sizes and related food costs as received by the consumers from each of the three systems.

Table 4 shows the average computed meal costs for each installation. A random sample of meals served (referred to as trays) was selected at each installation as follows:

	Trays (meals)
Ft. Myer	2199
Bolling AFB	1212
Ft. B. Harrison	2057

The costs of the food items on each tray were calculated using standard military recipes and 1 October 1973 food issue costs. These individual tray costs were averaged over each type of meal and recorded in the "standard portions" column in Table 4. The "actual portions" column was obtained by applying a cost adjustment factor for each food item. This factor was determined by taking trays of food at various times during the meals, weighing the portions of each food on the tray, and dividing by the standard (recipe) portion size. Thus, each food item had its own factor for each installation.

Average food group costs and cost adjustment factors are shown in Table 5. The data indicate that Ft. Myer tends to give smaller portions of most food items regardless of their cost. The exceptions are the short order entrees and starch/vegetable groups which can replace or reduce portion sizes of the high cost meat cut and casserole entree groups. Both Bolling AFB and Ft. B. Harrison also tended to give smaller portions of the high cost and larger portions of some of the low cost food groups such as vegetables and starches. It was noted that Ft. Myer controlled portion sizes by using small dishes.

Table 6, which shows the percentages of each type of meal and their computed costs, is based on the total number of breakfasts, lunches, and dinners actually served between 1 July 1973 and 30 April 1974. The proportions of short order and continental breakfast meals are estimates derived from actual headcounts obtained during the one week of data collection at each base. The computed costs for each type meal are the actual costs of the average portions sizes of all selected meal components. Comparing the cost of the food offerings selected by the consumers from each of the three posts during the regular meal periods of breakfast, noon (including short order) and evening meals it is apparent that the meal costs at Ft. Myer are 13% below Bolling AFB. Even when the special steak meal which was served during the one week survey is not included in the Ft. B. Harrison data, the average computed meal costs at Ft. Myer are 8% less than average computed meal costs at Ft. B. Harrison (\$0.598). This lower average meal cost at Ft. Myer is most likely due to smaller portion sizes and merchandising techniques that encourage consumers to select lower priced food items.

TABLE 1
TOTAL ANNUAL COSTS

Cost Element	Ft. Myer	Installation Bolling AFB	Ft. B. Harrison
Direct Costs:			
Contract	\$1,172,113	\$209,625	\$413,142
Food	—	290,527	659,034
Labor (Gov't Supplied)	—	—	331,670
Total Direct:	<u>\$1,172,113</u>	<u>\$500,152</u>	<u>\$1,403,846</u>
Other Costs:			
Utilities	52,334	13,896	20,991
Bldg. Maintenance	35,970	1,200	21,464
Equip. Maintenance	—	6,000	20,247
Contract Admin.	135,067	38,673	—
Laundry	—	—	5,866
Supplies	—	22,570	24,195
Commissary Support	—	38,566	50,209
Transportation	—	—	6,283
Total Other:	<u>\$223,371</u>	<u>\$120,905</u>	<u>\$149,255</u>
Total Cost:	<u>\$1,395,484</u>	<u>\$621,057</u>	<u>\$1,553,101</u>
Cost Without Utility and Maintenance Costs:	<u>\$1,307,180</u>	<u>\$599,961</u>	<u>\$1,490,399</u>
Total Meals Served Annually:	<u>947,444</u>	<u>359,258</u>	<u>825,216</u>

TABLE 2
AVERAGE COST PER MEAL

Cost Element	Ft. Myer	Installation Bolling AFB	Ft. B. Harrison
Direct Costs:			
Contract	\$1.237	\$0.583	\$0.501
Food	—	0.809	0.799
Labor (Gov't Supplied)	—	—	0.402
Total Direct:	<u>\$1.237</u>	<u>\$1.392</u>	<u>\$1.702</u>
Other Costs:			
Contract Admin.	0.143	0.108	—
Laundry	—	—	0.007
Supplies	—	0.063	0.029
Commissary Support	—	0.107	0.061
Transportation	—	—	0.008
Bldg. — Equip. Maint. (not included)	—	—	—
Total Other:	<u>\$0.143</u>	<u>\$0.278</u>	<u>\$0.105</u>
Total Average Cost Per Meal:	\$1.380	\$1.670	\$1.807
Average Meals Per Day:	2,596	984	2,261

TABLE 3
MANPOWER ALLOCATION

	Ft. Myer	Bolling AFB	Ft. B. Harrison
Military:			
Contract Administration	10	3	0
Cooks	—	—	34
KPs	—	—	—
Others	<u>1</u>	<u>1</u>	<u>0</u>
Total Military	11	4	34
Civilian:			
Cooks	—	—	7
KPs	—	—	—
Commissary Support	—	4	5
Clerks and Typists	1	0	2
Drivers	<u>—</u>	<u>—</u>	<u>1</u>
Total Civilian	1	4	15
Total	12	8	49

TABLE 4

COSTS OF MEALS

	Ft. Myer		Bolling AFB		Ft. B. Harrison	
	Actual Portions	Standard Portions	Actual Portions	Standard Portions	Actual Portions	Standard Portions
Breakfast, Regular	\$.40	\$.41	\$.53	\$.43	\$.42	\$.38
Continental Break- fast	.26	.31	.52	—	—	—
Lunch, Regular	.63	.70	.66	.72	.58	.59
Lunch, Short Order	.54	.56	.76	.80	.68	.64
Dinner, Regular	.64	.69	.64	.68	.88*	.86*
Dinner, Short Order	.57	.58	—	—	—	—
Late Dinner	.56	.61	—	—	—	—
Early Breakfast	.45	.46	.56	.45	—	—

*The average cost of the regular dinner meals at Ft. B. Harrison was significantly affected by a special steak night meal which was served during the week the survey was conducted. Without this meal which was 1/6 of the sample meals the regular meal actual cost was .67 and the standard portion .64.

TABLE 5**AVERAGE COSTS AND COST ADJUSTMENT FACTORS BY FOOD GROUPS**

Food Group	Ave. Cost	Cost Adjustment Factors		
		Ft. Myer	Bolling AFB	Ft. B. Harrison
Meat Cut Type Entrees	0.49	0.89	0.92	0.91
Casserole Type Entrees	0.37	0.98	0.78	0.84
Short Order Entrees	0.24	1.08	0.87	1.02
Breakfast Items	0.18	0.90	0.88	0.97
Desserts	0.09	0.95	1.20	1.15
Fruits & Salads	0.05	0.94	1.11	1.19
Starches & Vegetables	0.04	1.11	1.10	1.28
Soup, Beverage, Bread	0.03	0.90	0.95	1.01
Average		0.97	1.02	1.04

TABLE 6

TYPES AND COMPUTED COSTS OF MEALS SERVED

	Ft. Myer		Bolling AFB		Ft. B. Harrison	
	% Meals	Average Food Cost	% Meals	Average Food Cost	% Meals	Average Food Cost
Breakfast, Regular	27.2	\$0.40	21.1	\$0.52	20.3	\$0.42
Continental Breakfast	0.6	0.26	—	—	—	—
Lunch, Regular	27.3	0.63	31.0	0.66	26.1	0.58
Lunch, Short Order	5.2	0.54	8.6	0.76	17.4	0.68
Dinner, Regular	19.8	0.64	35.3	0.64	36.2	0.88*
Dinner, Short Order	3.4	0.57	—	—	—	—
Late Dinner	9.8	0.56	—	—	—	—
Early Breakfast	6.6	0.45	4.0	0.56 ^{1,2}	—	—
Average Computed Food Cost/Meal		\$0.542		\$0.628		\$0.674

* Includes special steak night meal. (See footnote to Table 4.)

III. NUTRITION EVALUATION

The random sample of tray data discussed in the cost analysis was collected to obtain estimates of nutritional values for the meals actually selected by customers. The values were calculated for each food item, using the Armed Forces Recipe service formulations and US Department of Agriculture Handbook #8 Food Composition data and corrected for size of the serving and portion not consumed. The nutritional values were then summed over all food items comprising an individual meal (i.e., all food items on each tray), averaged for all meals, and compared to Daily Dietary Allowances (DDA). Table 7 expresses the average nutrient values as a percent of the DDA prescribed for the military.

To obtain nutritional values on a food consumed basis, the values were corrected for size of serving and portion not consumed by multiplying by the cost adjustment factor (discussed under cost analysis) and a waste factor. Waste data were collected for a random sample of trays at each location:

	Trays
Ft. Myer	1975
Bolling AFB	2032
Ft. B. Harrison	1675

When nutrition is analyzed on a per meal basis by assuming that each meal should provide one-third of the DDA (except as noted in Table 7 for fat), it is noted that many of the various types of meals, as represented by the food items actually selected by the customers from the serving line, do not meet the DDA/3 criteria. Seconds which are more readily available at Bolling AFB and Ft. B. Harrison and for which data were not collected would improve the meal by meal nutritional picture at those installations. However, analyzing nutrition on a daily basis provides a modified picture. Even though it is well known that few military customers attend three meals per day, menus are usually planned over a three meal or daily period and nutrition is usually associated with daily, not per meal nutritional values. Therefore, a daily comparison of meals selected is more appropriate. When the meals selected are measured as a percent of DDA over the three regular type meals (daily basis) for the prescribed nutrients for each of the three installations it is apparent that:

Caloric values are low for all three installations

Ft. Myer	Bolling AFB	Ft. B. Harrison
86%	94%	90%

Fat values exceed the maximum for all three installations

Ft. Myer	Bolling AFB	Ft. B. Harrison
106%	102%	102%

Thiamine value is low for Ft. B. Harrison

103%	108%	94%
------	------	-----

Niacin value is low for Ft. B. Harrison

105%	104%	93%
------	------	-----

All other nutrients, when considered on a daily basis over the three regular meals, exceeded daily requirements. Considering the combined accuracy associated with the small sample sizes, data collection procedures and the book value calculation methods, it would be logical to assume that, if an individual subsisted on a three regular meals per day basis at any one of these installations, the overall nutritional values associated with his food selections would be more than adequate.

IV. CUSTOMER EVALUATION

Face to face interviews were conducted at each installation during May 1974 to determine customer opinions of the food service system. A random sample of customers were individually interviewed by college students and female dependents of the military personnel trained by the U. of Washington for this purpose, using a structured questionnaire (see Appendix B). The composition of the sample is shown by Table 8, and the sample characteristics by Table 9. The samples showed some differences. The Ft. B. Harrison sample had higher percentages of females, RIKs, and people working at the installation. This group also had a lower average pay grade. At Ft. Myer more customers had work sites away from the fort, and at Bolling AFB fewer customers lived on base.

As part of the interviews customers were asked to rate each food item selected for their meal on a 9-point scale ranging from 1 (disliked it extremely) to 9 (liked it extremely),

TABLE 7

NUTRITIONAL EVALUATION OF MEALS

Average Percent of DDA

Nutrient and DDA *	Breakfast			Cont. Bkfst			Reg. Lunch			S/O Lunch			Reg. Dinner			S/O Din.			Late Din.			Early Bkfst		
	M	B	H	M	M	H	M	B	H	M	B	H	M	B	H	M	M	H	M	M	M	M	M	B
Calories-3400	25	29	26	22	29	32	31	32	31	39	37	32	32	33	32	31	31	32	25	29	30			
Protein-100g	35	43	37	21	48	45	51	42	51	69	59	49	45	48	51	51	40	49	45	40	49			
Fat-**	40	44	41	19	30	30	31	31	33	36	34	30	29	31	35	35	39	46	28	39	46			
Calcium-800 mg	63	71	78	73	64	65	70	69	70	93	82	62	64	62	70	70	66	84	43	66	84			
Iron-14mg	32	37	30	21	46	50	50	49	50	67	57	55	45	53	50	50	39	42	43	39	42			
Vit. A-5000 I.U.	26	36	34	18	77	94	31	70	31	64	26	124	64	53	31	31	29	39	27	29	39			
Thiamine-1.7mg	34	43	31	25	28	33	28	34	28	38	29	41	32	29	28	28	38	47	22	38	47			
Riboflavin-2mg	47	55	54	39	50	50	42	46	42	64	50	54	49	45	42	42	52	64	38	52	64			
Niacin-22mg	19	22	15	12	41	40	40	35	40	51	45	45	42	43	40	40	24	24	45	24	24			
Vit. C-60mg	40	52	32	27	69	78	76	99	76	51	71	88	90	94	76	76	48	34	75	48	34			

M = Ft. Myer B = Bolling AFB H = Ft. B. Harrison

*Daily Dietary allowance for male personnel as prescribed by AR 40-25/BUMEDINST 1011.3B/AFR 160.94, Medical Services Nutritional Standards, 10 August 1972.

**Should not exceed 40% of total caloric intake. For consistency, fat percentages in the table are one-third of those calculated using the average caloric and fat values of each meal.

where the center point 5 was "neither liked it nor disliked it". Interviews were conducted when the customer had completed or nearly completed his meal. Table 10 summarizes the average ratings obtained by food groups. In addition, customers rated the overall meal on the same scale. The averages of these ratings are also shown in Table 10.

In terms of the food items there were few significant quality rating differences between Ft. Myer and Bolling AFB. However, there were many significant differences between Ft. Myer and Ft. B. Harrison. The mean of the ratings for the main dishes, starches, vegetables, and desserts were significantly lower for Ft. B. Harrison than at Ft. Myer. Actually the only items rated either slightly higher and/or relatively the same at Ft. B. Harrison in comparison to Ft. Myer were the items over which a dining hall has very little control (bread, beverages, and cereals).

The mean overall meal ratings were significantly higher for Ft. Myer than for either Bolling AFB or Ft. B. Harrison. The Ft. Myer - Bolling AFB difference was small, but significant (6.9 Ft. Myer vs 6.7 Bolling AFB).

One series of questions asked during the interviews requested the customers compare ten characteristics of the food service system at their installation with those of other military installations where they have been stationed, rating each characteristic as "much worse", "little worse", "same", "little better" or "much better". The results are summarized in Table 11 and presented graphically in Figure 1. Of these ten questions covering significant quality aspects of food service, Ft. Myer rated much higher than Bolling AFB and Ft. B. Harrison in seven of these questions. These seven questions were: Overall meal quality; quality of food; variety of food; variety of S/O menu; cleanliness of personnel; attitude of personnel; and facility cleanliness. Ft. Myer rated slightly higher in a question on facility atmosphere, relatively the same as Ft. B. Harrison but lower than Bolling AFB or Ft. B. Harrison in the availability of second helpings. Since it was well known that the availability of second helpings had been a continuing problem at Ft. Myer, the astute customer perception and response to this problem tends to establish a high level of validity to other customer responses. It is apparent from these responses that the Ft. Myer system of food service is consistently rated significantly higher in the great majority of important customer value judgements. It is also apparent that the system of food service at Bolling AFB ranks second to Ft. Myer in these quality judgements.

Of particular interest, in addition to the much higher ranking of the food categories, is the much higher ranking of the appearance and attitude of the contract food service worker in the system of food service at Ft. Myer. The authors have many times observed the less than adequate attitude and cleanliness of military food service workers. These data indicate that this improvement at Ft. Myer is not an automatic benefit which can be associated with contract food service, because the system at Bolling AFB also uses

all contractor personnel. Even though Bolling AFB ranked higher than Ft. B. Harrison in cleanliness ratings of personnel, it ranked approximately the same in attitude of food service workers. These data, however, do suggest that a profit motive in dining hall operations can significantly affect the attitude and work habits of assigned personnel thereby greatly benefiting the customer. A contractor being paid by headcount has this profit motive which a military system does not have. In a military system of food service the more customers attracted to the dining hall, the harder the work is for the military personnel. Therefore, many times there is a negative incentive to attract more customers. Because of this negative factor there is a definite general tendency for military systems of food service to operate more for the convenience of the operators than for the customers. This general difference is apparent from the levels of service being offered by Ft. Myer in comparison to Ft. B. Harrison. Ft. Myer offers ten different type meals over seven meal periods while Ft. B. Harrison offers only four different type meals over three meal periods. Both the contractor and the customers benefit because of this extra service at Ft. Myer while, if the same meal service were offered at Ft. B. Harrison, it would be inconvenient to the food service workers and only the customers would benefit.

Customers were also asked to categorize their reaction to the dining facility as to whether they liked it, disliked it, or were indifferent to it. The following table shows the responses at the three military installations.

	Fort Myer			Bolling AFB			Ft. B. Harrison		
	LK	DSLK	INDF	LK	DSLK	INDF	LK	DSLK	INDF
No.	301	56	140	198	89	111	165	102	110
%	61	11	28	50	22	28	44	27	29

More than one-half of the respondents at Ft. Myer liked the facility which was not the case at Bolling AFB or at Ft. B. Harrison. It is interesting to note that virtually the same percentage of respondents were indifferent to the dining facility at each installation.

V. FINDINGS

Comparative findings are given in cost, nutrition and customer evaluations.

Comparative Costs

	Ft. Myer	Bolling AFB	Ft. B. Harrison
Total Cost/Meal	1.38	1.67	1.81
Average Food Cost/Meal As Rec'd By Customer	.542	.628	.674 (0.598*)

*Average food cost when special steak meal not included.

Comparative Nutrition

All three systems of food service complied with military DDA requirements over their three regular meal periods except as follows:

	Ft. Myer	Bolling AFB	Ft. B. Harrison
Calories	86%	94%	90%
Fat	106%	102%	102%
Thiamine	*	*	94%
Niacin	*	*	93%

*Over 100%

Comparative Customer Evaluations

		Ft. Myer	Bolling AFB	Ft. B. Harrison
Average Meal Hedonic Ratings		6.9	6.7	6.0
Ten Quality Characteristics	Highest	8	1	1
	Middle	0	6	4
	Lowest	2	3	5

TABLE 8
COMPOSITION OF CUSTOMER INTERVIEW SAMPLE

Pay Grade	Ft. Myer			Pay Grade	Bolling AFB			Pay Grade	Ft. B. Harrison		
	BAS*	RIK*	Tot		PAS BAS	RIK	Tot		BAS	RIK	Tot
E1	1	2	3	E1	0	3	3	E1	0	33	33
E2	12	27	39	E2	5	36	41	E2	4	143	147
E3	30	91	121	E3	36	60	96	E3	1	42	43
E4	47	131	178	E4	42	58	100	E4	1	47	48
E5	52	33	85	E5	66	5	71	E5	10	51	61
E6	43	1	44	E6	29	2	31	E6	7	8	15
E7	22	0	22	E7	33	4	37	E7	5	23	28
E8	4	0	4	E8	10	0	10	E8	1	0	1
E9	1	0	1	E9	4	0	4	E9	0	0	1
<i>Gr. Avg.</i> Mean Grade	4.8	3.6	4.1		5.0	3.3	4.3		5.2	3.2	3.3
Total	212	285	497		225	168	393		8	347	376
%	43	57		%	57	43		%	8	92	

*BAS denotes those enlisted men receiving a Basic Allowance for Subsistence (money).

*RIK denotes those enlisted men receiving Ration—In-Kind (free meals).

TABLE 9

SAMPLE CHARACTERISTICS

	Ft. Myer				Bolling AFB				Ft. B. Harrison			
	Army	Air Force	Navy	Marine Corps	Army	Air Force	Navy	Marine Corps	Army	Air Force	Navy	Marine Corps
Sample	321	61	109	6	11	261	116	5	352	10	14	1
%	65	12	22	1	3	66	30	1	93	3	4	0
Sex	Male		Female		Male		Female		Male		Female	
Sample	440		57		376		22		295		82	
%	89		11		94		6		78		22	
Live on Installation	Yes		No		Yes		No		Yes		No	
Sample	417		69		292		103		333		42	
%	89		11		74		26		89		11	
Live in Barracks	Yes		No		Yes		No		Yes		No	
Sample	408		18		287		12		324		14	
%	96		4		96		4		96		4	
Work on Installation	Yes		No		Yes		No		Yes		No	
Sample	168		327		224		174		330		47	
%	40		60		56		44		88		12	

TABLE 10
FOOD GROUP AND MEAL RATINGS

Food Group	Ft. Myer	Bolling AFB	Ft. B. Harrison
Main Dish	6.9	6.7	6.0(—)
Soup	6.6	6.0	6.3
Salad	7.3	7.2	6.9
Starch	6.5	6.4	5.5(—)
Vegetable	6.6	6.7	5.9(—)
Cereal	7.7	7.7	7.8
Bread	6.9	7.4(+)	7.1
Drink	7.9	7.9	7.9
Dessert	7.2	6.8(—)	6.9(—)
Overall Meal	6.9	6.7(—)	6.0(—)

(+) Significantly higher than Ft. Myer at the 5% level of significance.

(—) Significantly lower than Ft. Myer at the 5% level of significance.

TABLE 11

EVALUATION OF FOOD SERVICE SYSTEM CHARACTERISTICS

			Sample*	Much Worse	Little Worse	Same %	Little Better	Much Better
1.	Overall Meal	Ft. Myer	497	9	16	22	21	32
		Bolling AFB	393	18	19	32	15	16
		Ft. B. Harrison	376	23	26	21	16	14
2.	Quality of Food	Ft. Myer	497	5	13	36	20	26
		Bolling AFB	390	13	19	39	18	11
		Ft. B. Harrison	376	16	21	39	11	13
3.	Variety of Food	Ft. Myer	495	7	11	26	19	37
		Bolling AFB	387	19	23	34	12	12
		Ft. B. Harrison	373	19	19	31	17	14
4.	Variety S/O Menu	Ft. Myer	442	6	8	33	19	34
		Bolling AFB	301	18	15	39	15	13
		Ft. B. Harrison	321	15	10	45	16	14
5.	Portion Sizes	Ft. Myer	493	12	14	41	17	16
		Bolling AFB	388	7	13	51	17	12
		Ft. B. Harrison	375	10	10	49	15	16
6.	Offer 2nd Servings	Ft. Myer	372	39	14	31	7	9
		Bolling AFB	325	7	10	51	15	17
		Ft. B. Harrison	205	24	5	43	12	16
7.	Cleanliness of Personnel	Ft. Myer	492	2	4	44	22	28
		Bolling AFB	386	6	12	50	14	18
		Ft. B. Harrison	374	12	11	47	14	16
8.	Attitude of Personnel	Ft. Myer	491	5	9	34	22	30
		Bolling AFB	391	17	16	37	15	15
		Ft. B. Harrison	373	17	11	34	19	19
9.	Facility Atmosphere	Ft. Myer	497	4	5	30	22	39
		Bolling AFB	393	7	9	26	27	31
		Ft. B. Harrison	375	7	8	26	23	36
10.	Facility Cleanliness	Ft. Myer	495	1	5	40	22	32
		Bolling AFB	394	7	10	40	21	22
		Ft. B. Harrison	375	9	9	44	19	19

*The samples are sometimes smaller than the overall total because customers merely did not respond to all questions.

- 1. Much Worse (%)
- 2. Little Worse (%)
- 3. Same (%)
- 4. Little Better (%)
- 5. Much Better (%)

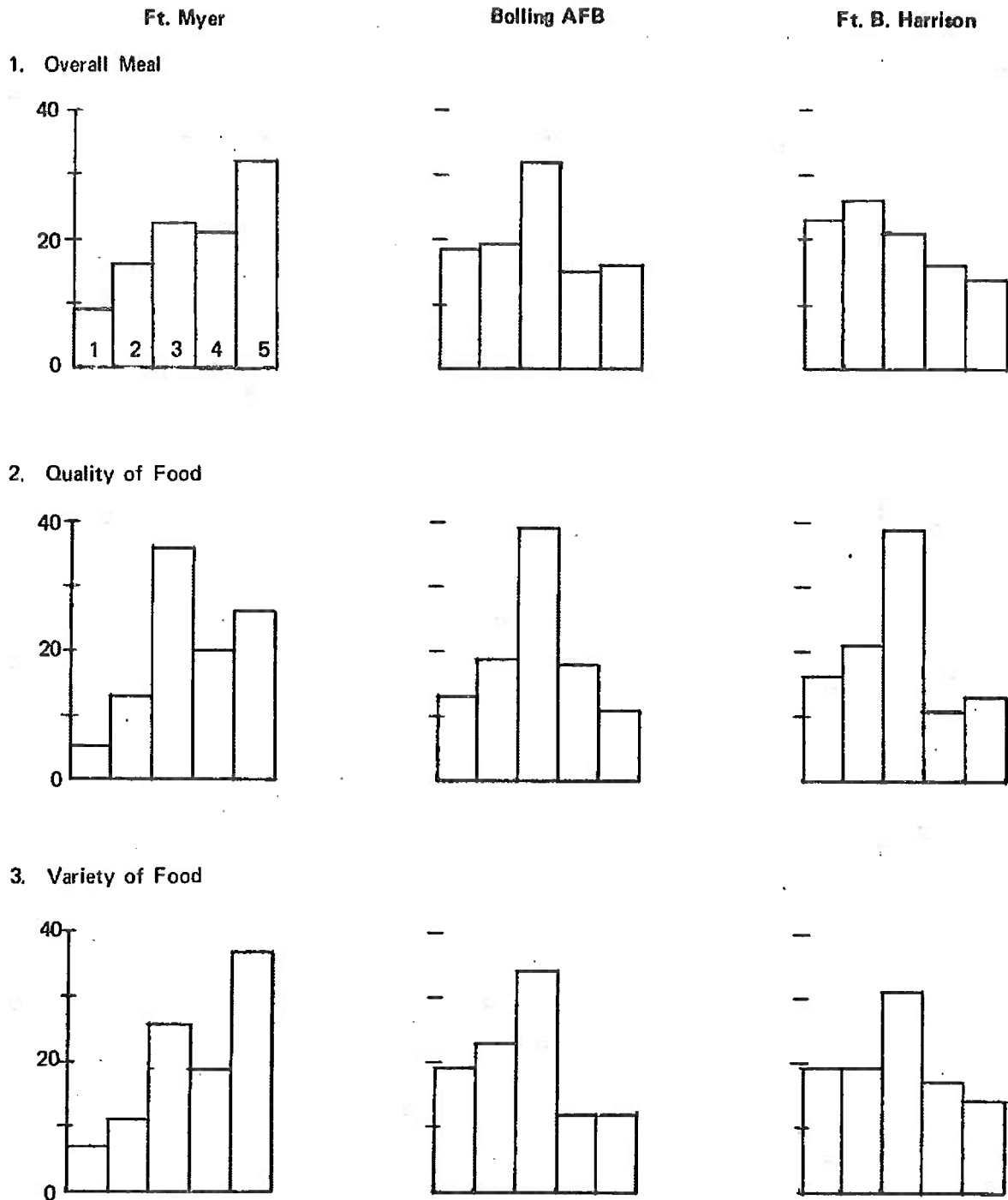


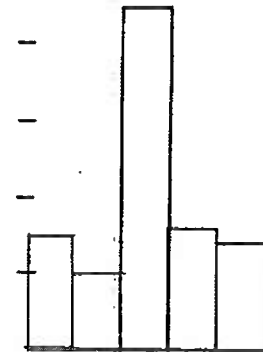
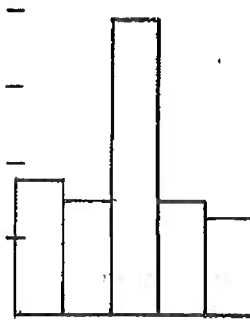
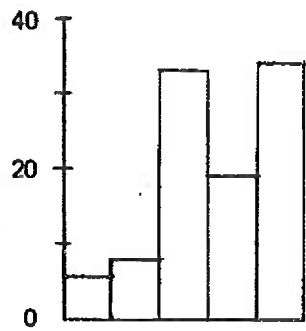
Figure 1. Response Histograms for Table 11 System Characteristics

Ft. Myer

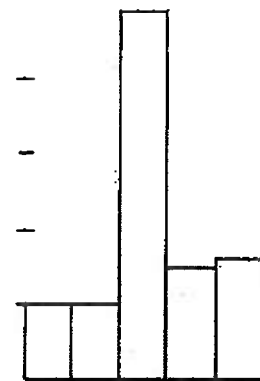
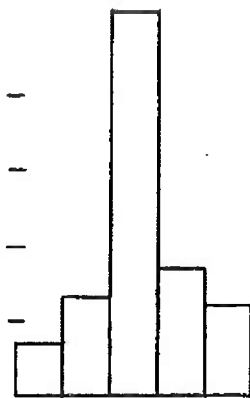
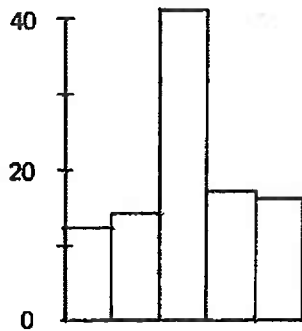
Bolling AFB

Ft. B. Harrison

4. Variety of Short Order Menu



5. Portion Sizes



6. Offer Second Servings

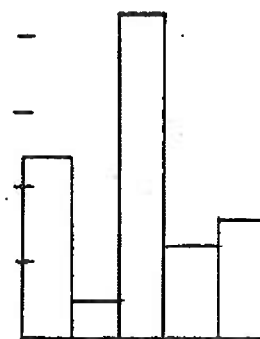
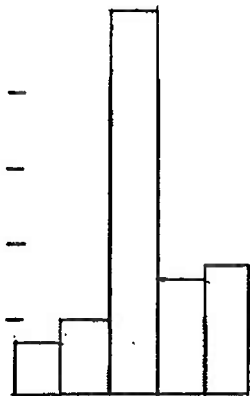
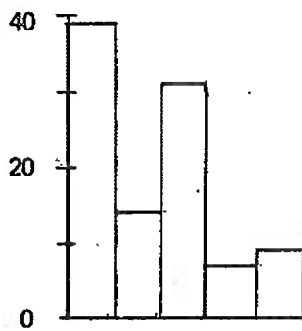


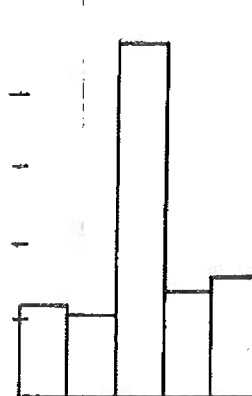
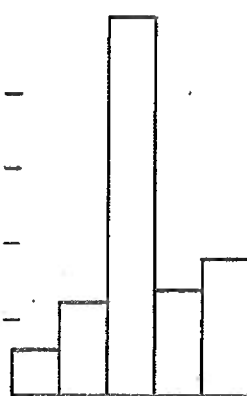
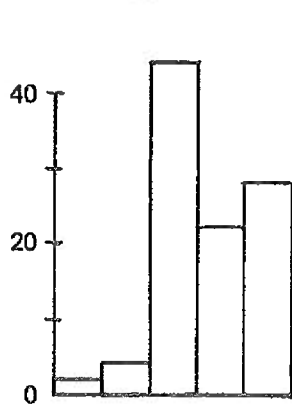
Figure 1. Response Histograms for Table 11 System Characteristics (Cont'd)

Ft. Myer

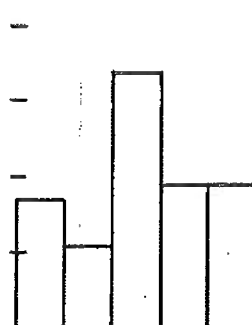
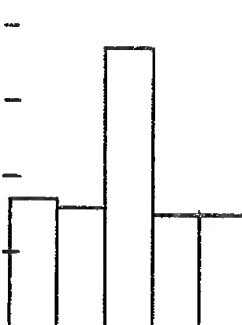
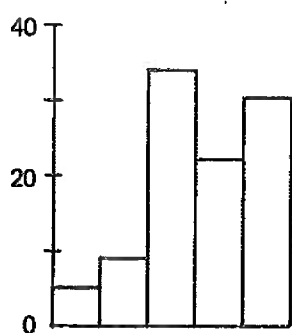
Bolling AFB

Ft. B. Harrison

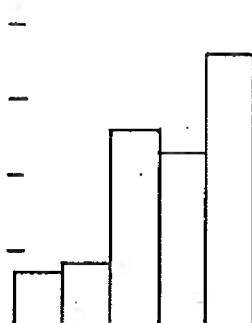
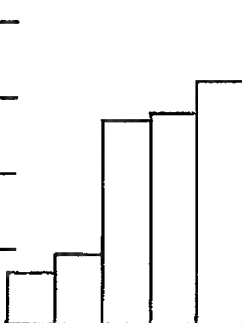
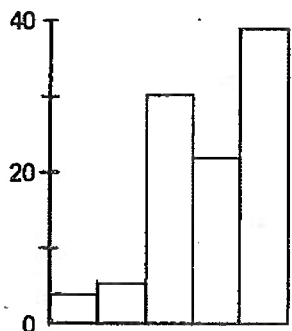
7. Cleanliness of Personnel



8. Attitude of Personnel



9. Facility Atmosphere



10. Facility Cleanliness

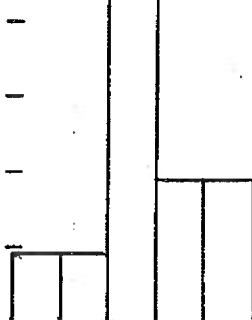
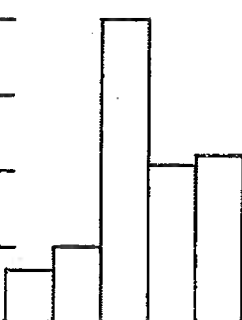
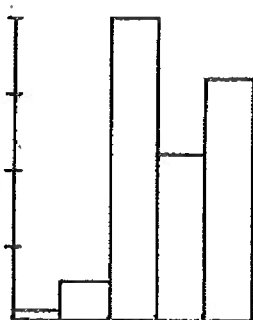


Figure 1. Response Histograms for Table 11 System Characteristics (Cont'd)

APPENDIX A — NOTES

Ft. Myer

- A. Laundry services included in contract.
- B. Commissary support not required.
- C. Transportation costs included in contract.
- D. Contract Administration:

Dining Facility:

		Salaries	
Military	1 W-3	\$ 15,682	
	1 E-3	13,338	
	2 E-7	22,894	
	4 E-6	39,016	
	1 E-5	8,078	
	1 E-3	6,180	
		<hr/>	
		\$105,188	\$105,188
Civilian	1 GS-3	\$ 8,112	
	\$8,112 x 1.0844 (benefits) =		\$ 8,797

Headquarters Troop Command Supply Office:

Military	1 O-5 (10%)*	\$ 2,324	
	1 O-1 (10%)	952	
	1 E-7 (33 1/3%)	3,815	
		<hr/>	
		\$ 7,091	\$ 7,091
Civilian	1 GS-3 (5%)	\$406	
	\$406 x 1.0844 (benefits) =		\$440

*denotes percent of time spent on dining facility related duties.

MDW Services Division

Military	1 W-3 (10%)	\$ 1,569
----------	-------------	----------

Cameron Station

Military	1 O-5 (40%)	\$ 9,256
----------	-------------	----------

Civilian	1 GS-9 Step 2 (20%)	\$ 2,514
----------	---------------------	----------

$\$2,514 \times 1.0844 \text{ (benefits) =}$	\$ 2,726
--	----------

Total Contract Administration	\$135,067
-------------------------------	-----------

E. Supplies included in contract.

F. Actual Contract costs from 1 July 1973 — 30 April 1974 were \$976,761, projecting to an annual cost of $\$976,761 \times 1.2 =$ \$1,172,113

G. Food included in contract.

H. Labor included in contract.

Bolling AFB

A. Laundry services included in contract (except table linen and drapes) negligible.

B. Commissary Support:

		Salaries
Warehousemen:	2 WG-4	\$16,561
Clerks:	2 GS-4	19,003
		<u>\$35,564</u>

$$\$35,564 \times 1.0844 \text{ (benefits)} = \$ 38,566$$

C. Contractor provides transportation.

D. Contract Administration:

Dining Facility:

		Salaries	
Military	1 E-8	\$13,338	
	1 E-7	11,447	
	1 E-5	8,078	
Chief of Services:	1 O-5 (25% 70)	5,810	
		<u>\$38,673</u>	\$ 38,673

E. Supply:

Supply costs for 1 Sept - 30 April (7 months) were \$13,166 which project to an annual cost of $\$13,166 \times 12/7 =$ \$ 22,570

F. Actual Contract costs from 1 July 73 - 31 March 74 (9 months) were \$157,613, projecting to an annual cost of $\$157,613 \times 133 =$ \$209,625

G. Actual Food Costs for 1 July 73 - 30 April 74 (10 months) were \$242,106, which project to an annual cost of $\$242,206 \times 1.2 =$ \$290,527

H. Labor is included in the contract.

Ft. B. Harrison

A. Laundry estimate based on FY 73 costs. \$ 5,866

B. Commissary Support:

		Hourly rate	Annual Salaries
Warehousemen:	2 WG-5	\$4.59/hr	\$19,094
	1 WL-1	\$5.72/hr	11,898
Clerks:	1 GS-3		8,112
	1 GS-3		7,197
	Total		<u>\$46,301</u>

$\$46,301 \times 1.0844 \text{ (benefits)} = \$ 50,209$

C. Transportation Costs:

Personnel Costs:

Rations are delivered 3 times a week averaging 5 hours per delivery.

Driver is WG-8 Step 4 at \$5.64/hour.

$\$5.64/\text{hr} \times 5 \text{ hrs/del.} \times 3 \text{ times/week} \times 52 \text{ weeks/year} = \$4,399$

$\$4,399 \times 1.0844 \text{ (benefits)} = \$4,770$

Vehicle Costs:

2972 mi/yr \times \$.1164/mi + \$310.70 depreciation = \$ 657
 plus 2240 mi/yr \times \$.2258/mi + \$350.17 depreciation = \$ 856

Total Transportation Costs \$ 6,283

D. Contract Administration office oversees 305 contracts annually and reports that this contract does not require any more time than the others, thus costs of administration are negligible. However, military dining hall personnel, to some degree, monitor the Contractor's performance. Their costs are included under H.

E. Supply costs as provided by Services Division. \$ 24,195

F. Actual KP Contract Costs from 1 July 73 – 30 April 74 (10 months) were \$344,285. Projected on an annual basis $\$344,285 \times 1.2$ = \$413,142

G. Actual Food Costs for 10 months from 1 July 73 – 30 April 74 were \$549,195, which project to an annual food cost of $1.2 \times \$549,195$ = \$659,034

H. Dining Hall Personnel:

		Annual Salaries
Civilian:	1 GS-3 Clerk	\$ 8,112
	1 GS-2 Clerk	7,197
	3 WG-8 Cooks	30,680
	1 WG-8 Baker	10,900
	3 WG-5 Cooks Helpers	26,167

Total	\$ 83,056
$\$83,056 \times 1.0844$ (benefits) =	\$ 90,066

		Annual Salaries
Military:	1 W-3	\$ 13,367
	1 E-7	11,447
	5 E-6	39,016
	4 E-5	32,348
	10 E-4	66,310
	10 E-3	61,800
	3 E-2	17,316

Total	\$241,604
Total Dining Hall Personnel	\$331,670

APPENDIX B -- QUESTIONNAIRE

USAF SCN 74-128

Form

UNIVERSITY OF WASHINGTON
Office of Institutional Educational Research

Location (Circle number): 1 2 3 Date Time

Meal (Circle number):

Break- fast	Lunch	Dinner	Late Dinner	Early Break- fast	Short Order	Cont. Break- fast
1	2	3	4	5	6	7

We are conducting a survey to find out what people think of the dining facilities here.

1. I am going to ask you to rate the food you just ate. For each food, will you tell me if you liked it extremely, liked it very much, liked it moderately, liked it slightly, neither liked it or disliked it, disliked it slightly, disliked it moderately, disliked it very much, or disliked it extremely. This card has a list of these ratings.
(Interviewer-circle the number of the rating.)

a. Main dishes? (including sauces
and gravies)

Food Code

1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9

b. Soups? (do not ask at
breakfasts)

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

c. Salads and salad dressings?
(do not ask at breakfasts)

1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9

d. Potatoes and starches?

1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9

e. Vegetables? (do not ask at
breakfasts)

1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9

f. Cereals? (breakfasts only)	Food Code	1	2	3	4	5	6	7	8	9
g. Breads and sweetrolls?		1	2	3	4	5	6	7	8	9
		1	2	3	4	5	6	7	8	9
h. Drinks?		1	2	3	4	5	6	7	8	9
		1	2	3	4	5	6	7	8	9
i. Desserts and fruits?		1	2	3	4	5	6	7	8	9
		1	2	3	4	5	6	7	8	9

2. Overall, how do you rate the meal you just ate, using the same scale?
(Circle number)

1 2 3 4 5 6 7 8 9

3. Now I am going to read a list of some characteristics of food service. For each one, will you please compare this meal and service with meals and service you have experienced at other military dining facilities?

First of all, what about the meal as a whole? Compared with meals at other military installations you know, was this meal (Read choices and record. Repeat for each item.)

Much Worse	Little Worse	About Same	Little Better	Much Better
---------------	-----------------	---------------	------------------	----------------

- a. Overall meal
- b. Quality of food
- c. Variety of food
- d. Variety of short-order menu
- e. Portion sizes or quantity of food
- f. Offering second servings
- g. Cleanliness of food service personnel
- h. Attitude of food service personnel
- i. Atmosphere in dining facility
- j. Cleanliness of dining facility

4. Overall, do you like, dislike, or are you indifferent to this dining facility?

Like

Dislike

Indifferent

5. How many months have you been using this dining facility?

Months

6. About how many meals do you eat in this dining facility during a typical week?

7. Are there any other features at this dining facility you like?

a.

b.

8. Are there any other features you dislike?

a.

b.

9. What changes would you like to see made in this dining facility?

a.

b.

10. What other comments would you like to make about this dining facility?

11. Branch of service?

12. Pay grade?

13. M F

14. Are you on separate rations?

Yes

No

15. Do you live on this installation?

Yes — In the barracks?

Yes

No

No

16. Do you work on this installation?

Yes

No — Where do you work?

Interviewer